BULLETIN No. 13.

REPORT

ON THE

PROGRESS OF THE WORK

OF THE

EXPERIMENTAL FARMS

OF THE

DOMINION OF CANADA.

EVIDENCE GIVEN BEFORE THE

COMMITTEE ON AGRICULTURE AND COLONIZATION

OF THE

HOUSE OF COMMONS,

JUNE 2nd, 1891.

BY

WILLIAM SAUNDERS,

Director of Experimental Farms.

REPORT

ON THE

PROGRESS OF THE WORK

OF THE

EXPERIMENTAL FARMS

BY

WM. SAUNDERS.

Director Dominion Experimental Farms.

MR. CHAIRMAN AND GENTLEMEN OF THE COMMITTEE ON AGRICULTURE AND COLONIZATION.

It affords me very much pleasure to be privileged again to come before you to render some account of my stewardship and to indicate some of the points of interest connected with the work of the Experimental Farms which I have the honour to direct, under instruction of the Minister of Agriculture. You will find in the annual report which is before you a very full account of the work which was carried on last year at each of the five farms which have been established by the Government, but as many of you may have had but little opportunity of looking over this report, you will pardon me if I refer to a few points contained in it, with the view of showing the progress made.

DISTRIBUTION OF SEED GRAIN.

The distribution of seed grain for test is held to be one of the most important branches of work carried on at the Experimental Farm. The great interest which has been awakened in this subject far exceeds our anticipations. Last year we had, as

you will find by the report, requests for samples of grain to the extent of 12,353. These came from 5,896 different farmers, and these having been supplied, would not, in most cases, receive samples this year, we have, however, had applications in 1891 from 4,388 additional parties, which has involved the further distribution of 11,230 3-lb. samples, or between 16 and 17 tons of seed grain. The following are the varieties of grain which have been sent out with the number of 3-lb. bags of each. Oats, 4,702; barley, 3,003; wheat, 2,091; peas, 1,089; rye and corn, 113; and potatoes 232. Many gratifying reports have been received from the farmers who have participated in this distribution, and in the annual report you will find the opinions of some of them under the heading "Distribution of Seed Grain." The Ladoga wheat, which was one of the first varieties of grain distributed in this way four years ago, is growing very much in favour in the North-West. During the past year the inquiries for that wheat have been very numerous from settlers who desired to purchase it in quantities, and all we could supply from the Experimental Farms has been disposed of in that manner. A farmer at Griswold, Manitoba, Mr. Hanna, who received a 3-lb sample four years ago from the Experimental Farm, wrote to me during the winter to say that he now had 1,500 bushels of this wheat from that sample, for which he was finding a ready demand for seed at a higher price than he could get for ordinary grain. I have with me, Mr. Chairman, a sample of Ladoga wheat which was grown at Prince Albert, in 1890, to which I would like to call special attention, as I think it is the finest sample of spring wheat I have ever seen. It weighs 66½ lbs. to the bushel, 6½ lbs. over the standard, and is very uniform in size and of the highest quality. Specimens of this grain have been sent to prominent millers and grain-buyers in Canada, the United States and Great Britain, and they all agree in the opinion that it is one of the finest samples of spring wheat that they have ever seen. This being grown so far north as Prince Albert in such perfection seems to indicate that there is a large area in that district for profitable wheat culture, and which in all probability this variety will help to fill.

Mr. E. Plaxton sent me this sample from Prince Albert. He received a 3-lb. bag three years ago, and last year had a crop of 172 bushels, of which he says this is a fair sample. I mention this to show that these samples of grain, which may not at first awaken very much

interest or command general attention, will in time find their proper places all over the country. Some localities will be found especially adapted for their cultivation, and others again where they are of little or no value. Ladoga wheat in Ontario has not been generally successful, except in some of the northern districts; it has suffered more than other sorts from rust, and does not seem to have the power of adapting itself to the climate of western Ontario. It does well in the more northern parts of this Province, in Quebec and in some parts of the Maritime Provinces. Nowhere, however, has it done so well as in the drier districts of the North-West, where very little is known of rust on any varieties of wheat. There it seems to be at home, and has been able to adapt itself to such conditions of climate as exist in a way that was scarcely anticipated. At the outset there were some doubts as to whether this wheat had the requisite quality for a North-West wheat. It was said to be a little thick in the skin and dark in colour, but in these particulars it has improved by cultivation since its introduction into the North-West. The skin has become thinner, the grain is brighter, and now it is usually graded as of first quality by those most competent to judge.

TESTS OF GRAIN, ROOTS, &C.

You will also find in the annual report full particulars of a large number of tests of different varieties of grain, roots, potatoes and other farm products, which have been grown on the Central Experimental Farm. This work is being continued during the present season, and I hope to have the pleasure of visits from as many members of the committee as can find it convenient, as the season goes on, so that all may have the opportunity of judging for themselves as to the growth and productiveness of many of these varieties. There are at the present time growing on the Experimental Farm 69 named varieties of wheat; 61 of oats; 29 of 2-rowed barley; 22 of 6-rowed barley; or 181 varieties of cereals in all. To these must be added the new crosses and hybrids which have been originated on the Central Experimental Farm. I mentioned to you, I think, last year, that some work had been done in that direction on the farm—a class of work which I think is most important for this country. It consists in bringing together different varieties of grain, in the same way as you bring together different strains of cattle, and by cross fertilizing, produc-

ing new sorts, which have more or less of the impress of both the varieties used as parents. At the time I had the honour of meeting you last year we had produced 38 varieties. During the summer of last year, 76 others were originated in this manner, so that we now have 114 varieties of grain growing on the Experimental Farm which are entirely new. Most of these cover but small plots; some of them are only single plants as yet, but among them are some promising sorts. Ninety of these are wheat; 16, barley; and 8, oats.

EXPERIMENTS WITH FERTILIZERS.

The special tests with fertilizers, to which I made a brief reference last year, have been continued; 105 plots, of one-tenth of an acre each, are devoted to this special work, where the same fertilizers are applied each season, with test-plots not fertilized amongst them for comparison. The same varieties of grain are grown on these plots every year, and it is hoped that we shall thus be able, in the course of a few years, to ascertain the effects of each fertilizer or group of fertilizers on the crops under treatment.

TESTING THE VITALITY OF SEED GRAIN.

The tests of grain as to vitality have also been continued during this spring. Last year there were received for test 1,245 samples, many of them coming from farmers residing in distant parts of the Dominion, who desired to know if the grain they held in stock for seed was suitable for that purpose. A glass structure, known as the seed-testing house, has been built specially for this work. Those of you who have had practical dealings with farm work will know that sometimes in the harvest season the weather is unfavourable, and if the grain is frosted, or is stored in a damp condition, its vitality is very often seriously injured, and it becomes a matter of importance then for the farmer to know just what percentage of this grain will germinate. Every farmer in the Dominion has the privilege of sending to the Farm samples of grain through the mail, free of postage; they are tested and the information is given free of charge with as little delay as possible. This season, between the 1st of January and seeding time, 2,757 samples were tested and reported on.

EXPERIMENTAL FARM CROPS.

More than 300 acres of land are now under crop at the Central Farm, including wheat, 20 acres; barley, 45; oats, 90; rye, 15; peas, 20; corn, 20; mixed grain, 35; roots, 16; potatoes, 5; and meadow, 40. In addition to the 181 varieties of named cereals to which I have already referred as now growing on this land, there are 69 varieties of corn, 27 of peas, 21 of beans, 111 of named potatoes, and 153 varieties of seedling potatoes—264 in all. There are also 28 varieties of turnips, 14 of mangels, 24 of carrots, and 13 of sugar beets. These facts will enable you to form some idea of the extent of the experimental work going on. Notes are taken of all these varieties as to their earliness, productiveness, etc., not only here, but of many of them at the branch experimental farms also, and these notes are compared at the close of the season. From the information thus gathered a tolerably accurate opinion can be formed as to how far they are likely to be useful to the farmers residing in the different Provinces of this country.

PROGRESS IN STOCK, DAIRYING, &C.

Some additions have also been made to the stock on the Central Experimental Farm. A few Durhams of good milking families have been added to the herd, also some Devons and Galloways; eight Quebec Jerseys or Canadian cows have been selected in the eastern part of Quebec, these being good representatives of that particular family of cows, the descendants of the importations from Normandy by the early French settlers. These cows are promising as milkers, and give rich milk. Feeding experiments are being tried with the different breeds, and experiments also in crossing. Eight additional grade cows have been purchased for the dairy, which brings the total number of cattle on the Farm at present to 87. There are 35 pure-bred cows, 11 grade cows, 7 pure-bred bulls and 34 young animals. During the year an experimental dairy building has been erected, supplied with the necessary apparatus for carrying on butter-making in the most approved manner. There is a store-room also, in this building, for curing cheese, where some of the products of the experimental dairy stations, which are now being organized by Professor Robertson, will be stored. Some of these products will be sent to the Central Farm, in order

to ascertain the best methods of curing, and also for the purpose of comparing the cheese made in the different Provinces, so that defects in quality may be discovered and remedied, with the view of bringing the whole to a uniform standard as a first-class product, so that it may command the best prices in the markets of Europe.

A piggery has been built and stocked with four pure breeds of pigs. Six pens were also filled with grade animals, which have been submitted to feeding tests during the winter. Most of these have lately been disposed of, as the experiments are concluded. An engine-house has also been erected, with shafting running the full length of the barn, so that conveniences may be available for threshing, also for grinding and cutting food wherever required. The planting of shelter belts of trees around the Farm is nearly completed, over 3,000 trees having been planted this season. The objects in planting these are to afford shelter and also demonstrate the rate of growth of the different varieties in this part of the Dominion.

CORRESPONDENCE, DISTRIBUTION OF BULLETINS, &C.

Perhaps no feature of the Farm work will convey a clearer idea as to the interest which farmers are taking in what is going on than the increase in the correspondence between the farmers of the country and the Experimental Farm. You all know that farmers as a class are not fond of letter-writing, and with many a man the desire for information must be very strong to induce him to write a letter. The letters received at the Central Experimental Farm in 1889 numbered 6,864, whereas during the same period in 1890 the number was 17,539, an increase of nearly three-fold. The number of bulletins and reports sent out in response to applications, in 1889, amounted to 41,584; last year they numbered 218,129, more than four times as many as in the previous year. The names on the permanent mailing list, which have been put on by special request, number now over 21,000, showing that the reports and bulletins are in great demand. The early editions were only 5,000; this was soon increased to 10,000, then to 20,000, and now we are issuing 25,000. One of the honourable gentlemen present asked whether these bulletins were published monthly. They are not published at any stated time, but as soon as any subject has been sufficiently worked up to permit of such conclusions as are likely

to be valuable to the farmers of this country a bulletin is issued. During the past month two bulletins have been printed, and sometimes several months will pass without an issue.

HORTICULTURAL WORK.

The Horticultural Department at the Central Farm, under Mr. John Craig, is making good progress, and a large number of additions have been made to the fruit trees. There are now on the Experimental Farm over 500 varieties of large fruits, including apples, pears, plums and cherries; also, 343 varieties of small fruits, such as grapes, raspberries, strawberries, currants and gooseberries. Besides these, there are several hundred sorts of new fruits, which have been produced either by selection or by crossing. The question of vegetables has also been taken up on a rather large scale during the past year, and is again under process of test this season. Last year 51 varieties of cabbage were tested, 57 of tomatoes, 50 of peas, 31 of cauliflower, 32 of lettuce and celery, with smaller numbers of other vegetables. The different qualities of many of these sorts are taken note of and the results submitted in the annual report. In the horticultural branch experiments have also been carried on with regard to the treatment of apple scab. You all know that the black scab on apples lessens the value of a large quantity of the fruit produced in Ontario, Quebec and the Maritime Provinces. It is believed that this disease can be prevented or checked by the use of fungicides if applied at the proper time. Experiments have been conducted to determine the best time to apply such remedies, the strength of the mixtures which should be used and the most economical and convenient methods of making the application. Bulletin No. 10 contains the results of this special work on apple scab.

FORESTRY.

The demands from Manitoba and the North-West for samples of forest trees for experimental planting on the plains has been very great. A little over a year ago, under instruction of the Minister of Agriculture, an announcement was made that the Experimental Farm would make a limited distribution of young forest trees for test on the Western Plains. One hundred thousand trees had been secured and arrangements made to put those up in 1,000 packages o-

100 trees each, thinking this would be an ample supply; but within five or six weeks after the announcement was made 2,600 applications were received. The requests were complied with, as far as the material would allow, and a circular was sent to those who did not receive any, stating that if any further distribution was decided on their names would be considered first. By instruction of the Minister, preparations were made to distribute 200,000 more in the spring of 1891, taking first the names of those who applied last year. This has been done, and about 400 additional applicants supplied. By these means it is hoped that at some 3,000 points small groves of trees will be established, which, in the course of a few years, will begin to produce seed themselves. We shall thus have many additional points at which the seeds of trees will be obtainable for further distribution and planting as one of the results of the work which has been carried on during the past two years at the Experimental Farm.

Besides sending to private individuals, larger packages have been sent to the Indian agencies, Mounted Police stations and other public institutions throughout the North-West, and instructions have been given to the heads of these departments to take special care of the trees, and report to the Experimental Farm from time to time as to their success. The Canadian Pacific Railway having established twenty-five experimental gardens along their line between Moose Jaw and Calgary, a package was sent last year to each of these gardens for test, and this year a second supply has been forwarded. It is believed that these distributions will have the effect of stimulating tree-planting and of awakening a greater interest in this subject, so important to the settlers in the North-West. The experiments carried on at Indian Head and Brandon on the Experimental Farms in tree-planting have only been partially successful. Experience has shown that for successful forest planting in the North-West we must begin with the native trees, and if young trees be raised from the seed of the ash-leaved maple, white elm and ash, gathered in the North-West, such trees will be very much hardier than if grown from seed ripened in Ontario, Quebec or the Eastern States. The young trees grown from eastern seed are often killed back from one-half to two-thirds of their growth the first winter, and it takes them several years to gain that degree of hardiness which trees grown from seed collected in the North-West pos-

sess at the start. Last year tree-seeds were plentiful, and arrangements were made, when in the North-West, to have a large quantity collected in the Qu'Appelle valley and about the Brandon Hills, Oak Lake and at other suitable points in Manitoba and the Territories. Efforts have been made for the past two years to obtain tree-seeds there in quantities, but with little success; but last season, through the energy of our Superintendents, Mr. S. A. Bedford and Mr. A. Mackay, who employed half-breeds, Indians and settlers to collect them, we secured in the course of five or six weeks, about three tons of seed. This gratifying success has enabled us to plant out several acres of tree-seeds on each of the Experimental Farms, which will in all probability produce several million trees, and has given the material for a general distribution, through the mail, of about 6,000 bags of tree-seeds to the settlers. This, added to the distribution of young trees, will, I believe, give tree-planting in the North-West a very considerable start, and the material sent out will, if taken care of, certainly be of great value to the country.

CHEMICAL WORK.

In the chemical branch, conducted by Mr. F. T. Shutt, excellent progress has also been made. A number of samples of soil from the different Provinces, including alkaline soils from the North-West, also heavy soils from the far western plains, have been analysed, with a view to determine the relative fertility of these different soils. Similar work has been done on samples of muck, peat, and muds from the Eastern Provinces, for the purpose of finding out how far these can be used as fertilizers. Some 50 or 60 samples of sugar-beets grown at different points in Ontario and the other Provinces have also been analysed, and the proportion of sugar contained in each ascertained. The results of most of this work will be found in the annual report for the past year. Many examinations of milk of the different breeds of cattle have been made, for the purpose of determining which are the richest and how far the quantity of butter can be influenced by change of feed. Mr. Shutt has also analysed 52 varieties of grasses, including a large number from the North-West, for the purpose of ascertaining whether any of the uncultivated sorts contain a larger proportion of nutriment than the grasses usually in cultivation. He has also tested many fodder plants, including corn cut at differnt stages of growth, also

ensilage, and such other miscellaneous products as have been thought to be of sufficient value to the whole country to warrant the conducting of these analyses. It is necessary to use some discretion in selecting material to be analysed, so as to undertake that only which is of the most general importance. Wherever there is any likelihood of such work being conducive to the general public good, then the labour and expense connected with it is not allowed to stand in the way of its being carried out.

ENTOMOLOGICAL AND BOTANICAL WORK.

The Entomologist and Botanist, Mr. James Fletcher, has also been doing very useful work. He has experimented to a large extent on injurious insects, especially on those which attack the more important crops of the country. You will find a number of important facts contained in his report in the last annual issue which is before you. Much of his time is necessarily occupied in giving information to correspondents who apply to him in cases of special insect invasion. Bulletin No. 11, on Injurious Insects, which has just been issued, and copies of which have been brought here this morning for distribution, contains some recommendations Mr. Fletcher has been making for the prevention of damage by some of these common insects to the farm and the garden.

In the botanical department a large number of experiments have been conducted with grasses likely to be useful to the different Provinces of the Dominion. Nearly 150 varieties of these are now under test for hardiness, productiveness and general usefulness for agricultural purposes. A number of applications have been received at the Farm for samples of the seed of grasses which are likely to be useful in the different parts of the Dominion, and in response to these requests 135 packages were sent out this spring, each containing from 15 to 20 varieties of grasses. These correspondents have engaged to test them and report the results of those tests.

POULTRY.

In the poultry house, which is under the management of Mr. Gilbert, experiments have been carried on as to the management of fowls in all stages of their growth, also on diseases of poultry and the preservation of eggs.

EXPERIMENTAL FARM, NAPPAN, N.S.

Satisfactory progress has also been made at the branch Experimental Farms. At the Nappan Farm, in Nova Scotia, under the efficient management of Col. Wm. M. Blair—a farm which serves the purposes of the Maritime Provinces—a large number of varieties of wheat, oats, barley, corn, field roots and potatoes have been tested during the past year. Special tests have also been made with artificial fertilizers and barn-yard manure. The barn and stables have been completed and partly stocked with Holsteins, Ayrshires, milking strains of Durham cattle, and with grades. The orchards at the Nappan Farm contain a large number of varieties of fruit trees, which have succeeded very well there. A great many farmers belonging to the Maritime Provinces visit the farm every season, and from the comments which these visitors make it would appear that they are highly pleased with the progress of the work going on in that district.

EXPERIMENTAL FARM, BRANDON.

The Brandon Farm is also doing good service, under the superintendence of Mr. S. A. Bedford, who is highly spoken of by all those who come in contact with him. A very large number of farmers visit that farm every year, Brandon being a railway centre and convenient of access. The farm is only a mile from the city, which makes it easily reached by visitors. The increasing interest manifested by the farmers in Manitoba in this work is very encouraging. Last year, when I visited that Province, I went to the Icelandic settlement, about forty miles from Brandon, to see the progress the Icelanders were making. Whilst talking to one of their leading men, he said: "I went up to see your Experimental Farm at Brandon last year with a number of my people. We never undertook a more profitable journey. We learned more there in connection with the varieties of grain that are useful for this country, the sorts of fodder desirable to grow for winter food for stock, and a great many other subjects, in one day, than we have ever had the opportunity of doing before." He also said: "We are going again next year, and intend to spend three or four days there, and bring away all the information we can get." That is one of the evidences of the useful character of the practical work which is being carried on at that institution, and the estimate which is being

formed of it by the farmers in the neighbourhood. The different methods of preparing the soil for crops have been tried there. The ordinary drill, the press drill and the broadcast seeder are all used. A number of varieties of fodder plants are being grown, which promise well for winter food for stock, including corn, mixtures of different kinds of grain, millets, Hungarian grass and rye. These have all been tested with a view of finding out the most profitable plants to grow as food for cattle. Many farmers who have seen the results of these tests on the Brandon Farm have begun experiments for themselves, and a very general interest has been awakened in the subject. The tests of fruit trees and vines are also closely watched, and much instruction is given, and many farmers have thus been saved from unprofitable investments. It is very common for a settler when he goes to the North-West and undertakes the planting of trees about a homestead to think of the trees he planted in Ontario, Quebec or elsewhere, and he frequently incurs much expense in getting such trees for his new home, never thinking that they are unsuited to the climate. The result is, that many thousands of dollars have been uselessly spent in that way for trees which have died the first winter. Such results are apt to discourage men from making future attempts. If we can demonstrate by practical tests that certain trees will succeed there, while certain others will not, we shall be able to save the farmers a good deal of money, by encouraging them to test only such as are likely to be successful. The barn and stables at Brandon are now completed, and it is hoped that during the coming summer such dairy stock as is most likely to be useful for that district will be introduced there.

EXPERIMENTAL FARM, INDIAN HEAD, N.W.T.

At Indian Head, nearly 200 miles further west, similar experiments with grain are being carried on. This farm is in charge of Mr. A. Mackay, a practical farmer of large experience, whose work is highly appreciated by all. During the past year 47 varieties of wheat, 32 of barley and 16 of oats were tested, as well as a number of varieties of Indian corn. The Indian corn has not thus far been found to succeed as well at Indian Head as at Brandon; the growth is neither so large nor so well matured. Spring rye is the most promising crop there for the winter

feeding of stock, and when cut green it makes excellent hay. Last year this crop yielded, at Indian Head, from 2 to 3 tons per acre. Spring rye has been sown at different periods, to ascertain when it should be seeded in order to produce the greatest weight of crop. Not many of the fruit trees tested have been found to stand the climate there, but there are a few that give some promise of success. In forest trees, those grown from the native seed are the only varieties that have yet succeeded to our satisfaction. A number of others are doing fairly well, but have been injured more or less by the climate. Stock has also been supplied at Indian Head. There are now on that farm 5 Durhams, 4 Ayrshires, 4 Holsteins, 3 Polled Angus and 11 grades, the latter purchased in the North-West. The services of the bulls of the pure-breeds are useful to the farmers, as good stock is scarce in that country.

EXPERIMENTAL FARM, AGASSIZ, B.C.

The farm at Agassiz, British Columbia, was the last established. In August, 1889, the Superintendent, Mr. Thos. A. Sharpe, was placed in charge, and since then the work under his energetic direction has gone on rapidly, and about 90 acres of land have been brought under cultivation. There are altogether 300 acres in that farm, and already a large number of experiments with grain and other farm crops have been carried on there, as at the other farms referred to. A considerable interest has been awakened among the farmers of British Columbia in this farm, and the number of visitors is steadily increasing. The farm is conveniently situated for visitors, from the fact that the train going west arrives there about 10:30 in the morning and that going east about 3 o'clock in the afternoon. The residence for the Superintendent is nearly completed, and will soon be ready for occupation. It is expected that during the summer a barn will be built to accommodate the horses and some stock. At present we have a very good Shorthorn bull there, and two pure-bred Shorthorn cows, to which other useful breeds will soon be added. The climate is specially adapted for the production of fruits. A large orchard, containing 400 varieties of fruit trees, has been planted, also 200 varieties of small fruits. Some of the plums, nectarines and peaches are already beginning to fruit, and the trees are making most promising growth. Over 400 varieties of forest trees and ornamental shrubs have also been

introduced, including a large number of hardwood trees from the east, a class of timber in which that country is very deficient. If we can establish the walnut, hickory, elm and other hardwoods, and show that they can be profitably grown, it will be a great benefit to that country, by furnishing suitable material in the future for manufactures which will spring up at different points. The clearing of the land is going on steadily, and it is hoped that in a short time that farm will be as well advanced as any of the others. Poultry is being tested at Agassiz, as the raising of poultry and the production of eggs are very important in British Columbia. At the present time large quantities of these products are imported from the Eastern Provinces.

EXHIBITIONS AND SALES OF GRAIN.

At all the Experimental Farms preparations were made last year and carried out for attending agricultural exhibitions in the several Provinces, and in this way the products of the farms were brought under the notice and observation of a very large number of the farmers who attend such fairs, and a knowledge of the work in progress was thus widely disseminated. A quantity of seed grain was also sent out in small packages or sold by the bushel from each of the branch farms, the price charged being a small advance on the ordinary market price of such grain, so as to partly cover the cost of extra cleaning, etc. Some very useful sorts have thus been disseminated among several hundred farmers, in quantities of 2 bushels or more to each, and it is highly probable that some of these will soon become the leading sorts in cultivation in the several Provinces of the Dominion.